

The Future Nuclear Arms Control Agenda and Its Potential Implications for the Air Force

Dr. Lewis A. Dunn

**INSS OCCASIONAL PAPER
AUGUST 2015**

70

INSS

United States Air Force
Institute For National Security Studies

**US AIR FORCE
INSTITUTE FOR NATIONAL SECURITY STUDIES
USAF ACADEMY, COLORADO**

The Future Nuclear Arms Control Agenda and Its Potential Implications for the Air Force

Dr. Lewis A. Dunn

INSS Occasional Paper 70

August 2015

USAF Institute for National Security Studies
USAF Academy, Colorado

The views expressed in this paper are those of the author and do not necessarily reflect the official policy or position of the United States Air Force, the Department of Defense, or the United States Government, SAIC or any of its sponsoring organizations.

TABLE OF CONTENTS

I. Introduction: The Future Nuclear Arms Control Agenda and Its Potential Implications for the Air Force.....	1
II. The Arms Control Context Today.....	1
The Obama Administration’s Arms Control Agenda.....	1
The Political Make-up of the Next U.S. Administration.	3
U.S.-Russian Political-Economic-Military Confrontation.	3
Heightened Need for Nuclear Assurance of U.S. Allies.	3
The U.S.-China Strategic Relationship at a Turning Point.....	3
An Institutionalized Humanitarian Consequences Movement.	4
The Lack of Consensus Agreement at the 2015 NPT Review Conference.....	4
Growing Risks from New and Aspiring Nuclear Weapon States.....	5
Continued Controversy over U.S. Nuclear Modernization.	5
Domestic Partisan Political Divisions	5
III. The Future Nuclear Arms Control Agenda – Looking out to the 2020s.....	6
U.S.-Russia Nuclear Arms Control – From New START Implementation to Beyond New START....	6
U.S.-China Strategic Engagement – Toward Greater Confidence-Building, Reassurance, and Mutual Restraint?.....	11
The 2015 Nuclear Non-Proliferation Treaty Review Conference – What’s Next?.....	16
The P-5 Process in an Evolving Arms Control Future	20
National and International Verification Initiatives – Adapting Existing Capabilities, Breaking New Ground.....	22
Multilateral Nuclear Negotiations and Activities – Near Term Stalemate, Longer-term Uncertainty .	25
IV. The Future Arms Control Agenda – Some Concluding Thoughts on Implications for the Air Force.....	26

ACKNOWLEDGEMENT

I would like to thank Rebecca Gibbons for her help in preparing this shortened version of my original analysis.

INTRODUCTION: THE FUTURE NUCLEAR ARMS CONTROL AGENDA AND ITS POTENTIAL IMPLICATIONS FOR THE AIR FORCE

Soon after his first inauguration, President Barack Obama in April 2009 in Prague, Czech Republic affirmed “America’s commitment to seek the peace and security of a world without nuclear weapons.” Since the Prague Speech, support for nuclear arms control has been a core component of the Administration’s national security policy. The purpose of this paper is two-fold: to consider the future nuclear arms control agenda during the closing years of the Obama Administration (near-term), under the next U.S. president (medium-term), and to 2021 when U.S.-Russia nuclear arms control under New START needs to be extended temporarily, replaced, or allowed to expire (longer-term); and to explore the implications of that evolving agenda for the Air Force. It is divided into three main sections.

First, the paper sets out today’s arms control context. These shaping factors will help to define future arms control challenges as well as opportunities.

Second, against the background of that arms control context, the main body of the paper then explores possible arms control developments, challenges, and future initiatives across a comprehensive set of “arms control domains.” These domains include not only traditional bilateral U.S.-Russia nuclear arms control negotiations but also other areas such as U.S.-China strategic engagement; the just-concluded 2015 Nuclear Non-Proliferation Treaty (NPT) Review Conference; the P-5 Process; proposed national and international verification initiatives; and multilateral nuclear arms control. In each domain, possible “wild cards” that could lead to arms control discontinuities are identified. This domain-by-domain discussion also identifies possible implications of the arms control future for the Air Force across three areas: Air Force missions, programs, and operations; Air Force contributions to U.S. arms control decision-making; and areas for Air Force “homework” to prepare for and engage effectively in an evolving arms control process in the years ahead.

Third, building on the preceding domain-by-domain analysis, the paper concludes by setting out some overarching judgments about bottom-line implications for the Air Force. There also is a quick reprise of the Air Force “homework” across the arms control domains.

THE ARMS CONTROL CONTEXT TODAY

There are a number of contextual or shaping factors that will influence significantly the future evolution of arms control – between now and the end of the Obama Administration as well as during the next administration and into the 2020s. Consider briefly the most important of these shaping factors.

The Obama Administration’s Arms Control Agenda. As first expressed in the April 2009 Prague Speech, the Obama Administration’s arms control agenda begins from its dual commitment, on the one hand, to seek “the peace and security of a world without nuclear weapons” and on the other hand,

“as long as these weapons exist . . . [to] . . . maintain a safe, secure and effective arsenal to deter any adversary, and guarantee that defense to our allies.”¹ This dual commitment was reflected in the 2010 Nuclear Posture Review, the negotiation of the New START Treaty, and in the forward-leaning positions on arms control and nuclear disarmament taken by the United States at the 2010 Nuclear Non-Proliferation Treaty (NPT) Review Conference.

Four years later, in his June 2013 Berlin Speech, President Obama reaffirmed American support for reductions in the role and numbers of U.S. and Russian strategic nuclear weapons, proposing that the United States and Russia negotiate a further reduction of one-third of deployed strategic nuclear weapons from the levels of the New START Treaty. The Obama Administration continues as well to support U.S.-Russian negotiations to reduce both countries’ non-strategic nuclear weapons. Russia has shown no interest in either proposal. Moreover, Russian violation of the INF Treaty has partly shifted the focus of U.S.-Russia nuclear arms control and has led in turn to pledges of continued U.S. efforts to restore Russian compliance with that Treaty.

On the international front, the Obama Administration proposed in December 2014 that nuclear-weapon states and non-nuclear-weapon states join in a new “International Partnership for Nuclear Disarmament Verification” to address and find solutions to the technical challenges of verifying nuclear disarmament. A first preparatory meeting of that International Partnership took place in March 2015, with the participation of twenty-five countries. In a reversal of the earlier U.S. refusal to attend

**The Context – Some Key Factors
Shaping Future Arms Control
Evolution**

- The Obama Administration’s arms control agenda
- The political make-up of the next Administration
- The U.S.-Russian-political-economic-military confrontation
- Heightened need to assure U.S. allies in Europe and Asia
- The May 2015 NPT Review Conference – a Forcing Event?
- The U.S.-China strategic relationship at a turning point
- An institutionalized process of P-5 engagement on nuclear issues
- Future national and international verification initiatives
- An institutionalized Humanitarian Consequences movement
- Growing risks from new and aspiring nuclear-weapon states
- Continuing controversy over U.S. nuclear modernization
- Domestic partisan political divisions.

either the Oslo or the Nayarit conferences, the United States decided to attend the December 2014 Vienna Conference on the Humanitarian Consequences of Use of Nuclear Weapons. With regard to China, the Obama Administration in the 2010 Nuclear Posture Review proposed an official U.S.-China stability dialogue. It has continued to support and pursue in multiple official and semi-official forums strategic dialogue with China to reduce mutual uncertainties about and provide mutual reassurance of each other’s strategic intentions, plans, and activities.

The Political Make-up of the Next U.S. Administration. As for the next president's arms control agenda, suffice it to suggest at this point in the discussion, that a Democratic president likely would continue today's broad arms control themes – with adaptations to reflect presidential priorities. By contrast, past experience suggests that a Republican president would likely be much more skeptical of nuclear arms control, not least the Obama Administration's declaratory support for the goal of abolishing nuclear weapons as well as arms control's payoffs vis-à-vis Russia. However, the experience of Republican administrations since that of President Reagan also suggests that there likely would be important elements of arms control continuity. Not least, "escape from arms control" is likely to prove very difficult for strategic, alliance management, non-proliferation, and domestic political reasons.

U.S.-Russian Political-Economic-Military Confrontation. Heightened political and economic confrontation has come to characterize the U.S.-Russian relationship. In large part, President Putin and his supporters within the Russian elite believe that the United States seeks to undermine Russia's role in the world, perhaps even to orchestrate a "color revolution" in Russia. They define Russia's foreign and military policy in terms of pushing back and asserting Russia's self-declared interests as well as status against the United States and its allies in Europe. What remains unclear at this point in time is how far Putin is prepared to go in asserting Russian influence in its "near-abroad," an area now including U.S. NATO allies, as well as in taking other steps abroad to challenge U.S. interests and positions. Regardless, for the first time since the end of the Cold War, there is a growing risk of a U.S.-Russian military confrontation in Europe.

Heightened Need for Nuclear Assurance of U.S. Allies. The need to assure U.S. allies continues to grow – given heightened concerns among NATO allies about Russian adventurism, Japanese concerns about China's assertiveness in Asia and the North Korean threat, and South Korean concerns about North Korea. In particular, U.S. NATO allies on the "front line" with Russia are focusing even greater attention on the nuclear dimension of the Alliance. Other NATO allies that had pressed in the past for U.S.-Russian negotiations on non-strategic nuclear weapons and for more rapid pursuit of nuclear disarmament have tempered their positions. In Asia, Japanese officials continue to strike an uneasy balance between support for nuclear disarmament and opposition to dramatic changes of U.S. nuclear posture and doctrine. So far, the processes of strengthened engagement on nuclear weapon issues instituted by the Obama Administration with both Japan and South Korea appear to have successfully reassured both countries. But shocks or surprises could trigger a crisis of confidence and result in calls for additional U.S. nuclear assurance measures. Absent such measures, both Japan and South Korea could rethink their non-proliferation commitments.

The U.S.-China Strategic Relationship at a Turning Point. At the Sunnylands Summit in June 2013, Presidents Xi Jinping and Barack Obama reaffirmed the goal of building a new type of major power

relationship between the United States and China. Today, a mix of cooperation, competition, and deep mutual political-military uncertainties and suspicions characterize this relationship. More important, the relationship could well be approaching a turning point. There are growing U.S. concerns about China's increased assertiveness in backing its territorial claims in the South China Sea. U.S. uncertainties about China's nuclear modernization interacting with Chinese uncertainties about U.S. missile defense and future prompt global strike capabilities could well lead to growing offense-defense military competition. Questions about Chinese nuclear modernization are likely to figure as well in the upcoming U.S. political debate about modernizing U.S. nuclear forces. At the same time mutual miscalculation and misjudgment in a U.S.-China crisis could escalate into military confrontation if not conflict between the two countries.

An Institutionalized Humanitarian Consequences Movement. Internationally, the Humanitarian Consequences Movement has emerged as a major feature of the arms control landscape since the 2010 NPT Review Conference. At that Review Conference, the Parties expressed “. . . deep concern at the catastrophic humanitarian consequences of any use of nuclear weapons” Since then, three international conferences have been held on this subject, one each in Oslo, Nayarit (Mexico City), and Vienna. Activists used each of these conferences to focus attention on the consequences of use of nuclear weapons, to highlight the limits of national or international responses to deal with those consequences, and to make the argument that the risks of use of nuclear weapons are greater than previously thought. At the recent 2015 NPT Review Conference, nearly all NPT Parties adhered to statements warning of the grave humanitarian consequences of any use of nuclear weapons -- and called for urgent nuclear disarmament action to address those risks. This movement will not simply “vanish” of its own accord. Indeed, as also evidenced at the 2015 Review Conference, the humanitarian consequences moment has dramatically changed the nuclear disarmament debate and created fairly widespread support for new approaches to nuclear disarmament.

The Lack of Consensus Agreement at the 2015 NPT Review Conference. The 2015 NPT Review Conference showcased very significant divisions between the NPT non-nuclear-weapon states and the NPT nuclear-weapon states on how to advance the Treaty's Article VI goal of nuclear disarmament. Many non-nuclear weapons states also signed what has become known as the “Humanitarian Pledge.” In so doing, these countries have pledged to “[i]dentify and pursue effective measures to fill the legal gap for the prohibition and elimination of nuclear weapons and . . . to cooperate with all stakeholders to achieve this goal” as well as “. . . to cooperate . . . in efforts to stigmatize, prohibit and eliminate nuclear weapons in light of their unacceptable humanitarian consequences and associated risks.” Ultimately, the participants in the Conference appeared ready to agree on a compromise Final Document covering not only nuclear disarmament but also non-proliferation and peaceful uses of nuclear energy issues. However, on the final day of the conference, the United States, the United Kingdom, and

Canada blocked consensus adoption of the Final Document. They did so because the document also contained language demanded by Egypt calling for the United Nations Secretary General to convene a conference no later than March 1, 2016 to launch negotiations to establish a Middle East free of nuclear weapons and all other weapons of mass destruction. Such action by the Secretary General would have broken with the way that all other nuclear-weapon free zones have been established, that is, by a process of engagement among the countries within given regions. For its part, Egypt knew all along that such language would be unacceptable but pressed for its inclusion regardless.

Growing Risks from New and Aspiring Nuclear Weapon States. New and aspiring nuclear-weapon states are posing increased risks to the United States, U.S. allies, and global non-proliferation efforts. North Korea's heightened nuclear and missile threat already has shaped U.S. decisions with regard to the size of homeland missile defenses. That threat shows no sign of lessening and could become even worse with an unpredictable Kim Jung-Un regime. Unless Iran's likely pursuit of nuclear weapons is stopped by negotiations or military action, there will be dangerous ripple effects throughout the Middle East and far beyond. Somewhat differently, today's burgeoning nuclear competition between India and Pakistan could grow even more intense in coming years as both countries deploy new nuclear and missile capabilities. In turn, a more robust Indian nuclear posture will indirectly impact first Chinese nuclear decisions and through those Chinese decisions, conceivably those of the United States.

Continued Controversy over U.S. Nuclear Modernization. Over the coming years, all of the existing triad of delivery systems will need to be replaced. Nuclear warhead life-cycle extension also will need to continue, assuming it remains too difficult politically to develop and field new replacement warheads. At the same time, modernization of U.S. nuclear production infrastructure also is needed to ensure a more responsive infrastructure that could support unexpected requirements as well as make it easier to continue the nuclear reductions process with fewer warheads retained to hedge against uncertainty. Modernization of command and control also will be needed. Recent experience makes clear that the resulting internal political debate and controversy will be intense – and the outcome uncertain overall as well with regard to specific steps.

Domestic Partisan Political Divisions. The intense political divisions and partisan debate of today's American political life are the final factor likely to shape the future arms control environment. These divisions already have and will continue to impact the specific approaches taken by the Obama Administration and its successors across national security issues, from relations with Russia to those with China, from negotiations with North Korea to those with Iran.

THE FUTURE NUCLEAR ARMS CONTROL AGENDA – LOOKING OUT TO THE 2020S

Against the preceding backdrop, this section explores the possible future U.S. arms control agenda. The following arms control domains are considered: U.S.-Russia strategic and non-strategic nuclear arms control; the U.S.-China strategic relationship; the aftermath of the 2015 NPT Review Conference; the P-5 Process; national and international verification initiatives; and multilateral nuclear negotiations and activities. In each case, the discussion focuses on possible developments in the near-term (next 2 years); medium-term (next 4-6 years); and longer-term (beyond 2020) – or in effect, the closing years of the Obama Administration, the next presidential administration, and the period after a decision in 2021 whether to extend, replace, or end New START. To some extent, any such analysis of future developments reflects informed judgments. For that reason, possible “wild cards” are highlighted that could impact the baseline projections. Implications for the Air Force are highlighted in each domain.

U.S.-Russia Nuclear Arms Control – From New START Implementation to Beyond New START

The centerpiece of U.S.-Russia nuclear arms control during the near to medium-term – subject to several “wild cards” discussed below – will be continued implementation of the New START Treaty. On balance, both countries’ leaderships can be expected to conclude that continued implementation serves each country’s security interests, for instance, in enhancing strategic predictability, eliminating nuclear weapons no longer needed in a non-Cold War deterrence relationship, providing a signal of limits on U.S.-Russian confrontation, and sustaining legitimacy of the NPT. At the same time, Russia has shown no interest in President Obama’s proposal of negotiations on a further one-third reduction of deployed U.S. and Russian strategic nuclear forces. Thus, formal U.S.-Russian arms control negotiations for strategic nuclear systems will almost certainly remain on hold during the final years of the Obama Administration and into those of its successor. (The issues of non-strategic nuclear forces and Russian non-compliance with the INF Treaty are considered separately below.)

Even with actual strategic nuclear negotiations on hold, however, a process of U.S.-Russian strategic nuclear dialogue most probably will continue during the near to medium-term. For Washington, continued arms control engagement with Russia would provide a hook to shape Russian calculations on INF withdrawal, provide insights into Russian nuclear posture, reassure U.S. allies, and support U.S. NPT diplomacy. For Russia, continued engagement would offer a hook to shape U.S. missile defense deployments and as with the United States, provide insights into U.S. offense-defense posture as well as support Russia’s NPT diplomacy. As in the Cold War, arms control engagement even if not formal negotiations also would allow each country to signal its desire to limit their growing political-military confrontation. Different political forums, including the New START Bilateral Consultative Commission, would be used.

New START “Wild Cards.” A near-term New START-related “wild card” is the repeated attempts by conservative Republican members of Congress to defund implementation of New START. Some members also have proposed U.S. withdrawal from New START. So far, such efforts have been unsuccessful. More likely than not, even with the new Republican Senate, those efforts are likely to remain unsuccessful during the closing years of the Obama Administration.

From a different vantage point, another near to medium-term “wild card” impacting the baseline assessment of continued New START implementation is that of Russian withdrawal from New START implementation. Statements in recent years by President Putin as well other senior Russian officials have raised that specter and linked Russian withdrawal to U.S. and NATO missile defense deployments. Barring an even more dramatic deterioration of the U.S.-Russian relations, however, the likelihood of Russia’s taking this step still appears low in light of the continued benefits to Russia of New START.

Over the medium-term, the possibility in the event of a Republican presidential victory in 2016 that a new Republican administration would support suspension of implementation of New START or withdrawal from the Treaty also is a “wild card.” It might do so partly as a response to Russian adventurism, partly in response to Russian INF non-compliance, and partly given arguments about the imbalanced impact of further nuclear reductions. In assessing this “wild card,” past experience provides some guidance. That experience strongly suggests that a next Republican president can be expected to conduct a full reassessment of U.S.-Russia nuclear arms control, including whether or not the United States should continue to implement New START. However, past experience, including the approach taken by the Reagan Administration in continuing to abide by the SALT I limits on strategic nuclear forces, also supports the judgment that New START implementation most probably would continue in the medium-term even in a new Republican administration.

Beyond New START – What if Anything?² Looking to the longer-term, as the initial period in which New START is in force comes toward an end in 2021, U.S. and Russian officials will need to address the question of whether or not to extend the Treaty for another five years to 2026 (as provided for by the Treaty). For Russia, as stated above, the New START regime provides considerable benefits in terms of greater predictability, transparency, and access to U.S. nuclear posture, thinking, and decisions. For the United States, the Treaty provides comparable benefits, while also having important alliance management payoffs. For both countries, New START serves their shared interests in a robust NPT. Thus, more likely than not, both Moscow and Washington will opt for the five-year extension.

Somewhat similarly, even before the 2026 termination of New START looms on the horizon, the question will again arise for both the United States and Russia whether or not to begin negotiations on a successor agreement. Here, many considerations are likely to be at work in each country: the predictability and other strategic payoffs of strategic nuclear arms control; the state of the overall U.S.-

Russian political-military relationship; NPT considerations; domestic political constellations and calculations; alliance relationships (at least for the United States); and not least “strategic inertia” after by-then over 50 years of strategic arms control treaties. Thus, it would be prudent to assume that at some point after 2020, serious negotiations will begin on a follow-on treaty to New START.

A post-2026 follow-on to New START might range from an agreement designed basically to continue the verification-transparency-notifications regime with some modest additional reductions in numbers of deployed systems to a more far-reaching agreement that would begin a process of verified elimination of nuclear warheads. The state of the U.S.-Russian political-military relationship is likely to be the most important determinant of the extent of the agreement. If Russian statements are taken at face value, the status of China’s nuclear modernization – and the state of the Russia-China relationship – also will be a factor.

Here, too, however, there is a final “wild card”: U.S.-Russia strategic nuclear arms control simply comes to an end with the end of New START and is not replaced in any way. (For example, bilateral U.S.-Russia nuclear arms control does not give way to U.S.-Russia-China trilateral arms control.) Though this “wild card” seems unlikely for the reasons suggested above, it cannot be simply discounted. A mix of factors, some more plausible than others, could conceivably bring about such an outcome or at the least result in serious debate about what next: a Chinese “sprint to parity,” an even more dramatic worsening of U.S.-Russian political-military relations, a new wave of nuclear proliferation if Iran acquires nuclear weapons, domestic politics in both Washington and Moscow, and the very complexity of a post-New START phase of nuclear warhead controls.

No Negotiations or Reductions of Non-Strategic Nuclear Weapons. Russia has shown no interest in proposals from the Obama administration for negotiations to reduce non-strategic nuclear weapons. This lack of interest appears unlikely to change over the near, medium, or longer-term. At the same time, given Russia’s actions in Ukraine – and its violations of the INF Treaty – support for such negotiations is declining among many U.S. NATO allies. Moreover, particularly among allies “to the East” on the new front line with Russia, there is little support for steps that would weaken the nuclear dimension of the NATO alliance.

To the contrary, there is interest in both Poland and the Baltics in actions that would link these countries more closely to NATO’s nuclear planning and capabilities. With regard buttressed nuclear links with Poland and the Baltics, the most likely steps over the near to medium-term would entail greater involvement in a reinvigorated NATO nuclear planning process. Possible contingency planning and logistics preparations for deployment eastward of nuclear weapons in a crisis also have sometimes been proposed by think tank experts. By contrast, though also sometimes proposed by outside experts, putting in place a Program of Cooperation with Poland for non-crisis nuclear deployments appears considerably

less likely. Still greater adventurism by the Putin administration, including INF withdrawal, would reinforce pressures to strengthen NATO's nuclear linkages to the East. As a result, assessment of the full range of options for strengthening the NATO nuclear dimension almost certainly will feature prominently in a next Nuclear Posture Review conducted by a new presidential administration.

Over the past half-decade, both Japan and South Korea also have sought strengthened nuclear assurances from the United States. The response of the Obama administration has been to create and institutionalize new nuclear deterrence dialogues with each ally. So far, these dialogues have met both countries' demands for nuclear assurance. Nonetheless, here, too, both countries could be expected to oppose future negotiations that would constrain significantly U.S. options to re-deploy non-strategic nuclear weapons in the Asia-Pacific region. Depending on the evolution of the North Korean and Chinese nuclear postures, these allies' calls for additional steps of U.S. nuclear assurance also could increase in the medium-term.

The INF Withdrawal Wild Card. The Obama Administration has declared that Russia has developed but not deployed a ground-launched cruise missile with a range in excess of 500 km. in violation of the INF Treaty.³ For quite some time, Russia has been a reluctant adherent to the limitations of the INF Treaty. With an eye on China as well as countries to their south, Russian officials and experts have expressed concerns about the Treaty's adverse impact on Russian security. The idea of "globalizing" the INF Treaty to include such countries also has been proposed. The Treaty is of indefinite duration; but it also includes a "right to withdraw" in the event that either party believes that "supreme national interests" are jeopardized.⁴

At the least, in the near-term, U.S.-Russia nuclear arms control agenda will include a continuing dispute over Russia's violation of the INF Treaty. A near-term Russian return to INF compliance seems highly unlikely, not least given the overall assertiveness of Putin's foreign policy. For its part, Russia has accused the United States of itself violating the INF Treaty, including with the widespread use of drone strike systems.

As for Russia's intentions over the medium to longer-term, they are uncertain. It is possible that Russia could return to full INF compliance. Here, there is a precedent. The Reagan Administration argued in 1983 that Russian construction of a Large-Phased Array Radar at Krasnoyarsk (and not on the Soviet perimeter) violated the ABM Treaty. After seven years of disputes, the Gorbachev leadership acknowledged a "technical violation" and agreed in 1990 to dismantle it. However, the overall character of U.S.-Russian relations was quite different then – and Gorbachev quite different from Putin.⁵

Or, perhaps more likely than a return to INF compliance, Russia could continue to "chisel at the margins" of the INF, e.g., developing border-line systems but possibly not deploying them. Again there is a partial antecedent, in this case in Russia's violation of the 1972 Biological and Toxin Weapons

Convention (BWC). It now is acknowledged that the Soviet Union from the start retained an offensive biological weapons program in violation of the BWC. The Reagan Administration first publicly raised the issue of Soviet BWC non-compliance in 1984. Eight years later, in 1992, as stated in the 2014 U.S. Compliance Report, "...Russian officials confirmed the existence of a biological weapons program inherited from the Soviet Union and committed themselves to its destruction." However, questions persist about that program's complete destruction.⁶

At the far end of the spectrum of options, Putin's Russia could decide to exercise the right to withdraw from INF. A number of considerations are likely to shape Russia's decision, including the expected reactions to withdrawal of the United States, Russia's NATO neighbors, and China; the potential attractiveness of withdrawal as a possible means to trigger a divisive debate within NATO as to how best to respond; conversely, concern that Russian INF withdrawal would energize NATO and possibly even lead to U.S.-NATO conventional military deployments closer to Russia's borders; the availability of credible military alternatives to carry out missions that might be executed by banned INF-range missiles; and perhaps not to be underestimated, a sense of "pay-back" for U.S. withdrawal from the Anti-Ballistic Missile (ABM) Treaty. Thus, Russian INF withdrawal should be considered an arms control "wild card."

U.S.-Russia Nuclear Arms Control: Some Possible Implications for the Air Force. Turning next to possible implications for the Air Force of future U.S.-Russia nuclear arms control developments, it is useful to focus on three baskets of such implications. Stated as questions, these baskets are: What could be the impact on Air Force missions, programs, and operations? Second, in what ways can the Air Force contribute to the future U.S. nuclear arms control decision-making process? Third, what "homework" should the Air Force do in the near- and medium-term?

With regard to the possible impact on Air Force missions, programs, and operations, a near to medium-term future of U.S.-Russia strategic arms control "on hold" is likely to have little impact – assuming, as above, that absent any of the "wild cards" New START implementation continues. That said, it is possible with strategic arms control on hold – with the blame placed on Russian refusal to engage – it could prove easier to create a domestic political consensus for nuclear force modernization. By contrast, occurrence of any of the "wild cards" that would result in U.S. or Russian withdrawal from New START (or defunding its implementation) would require adaptations of Air Force programs and operations. Thinking about such impacts, as proposed below, is one area for Air Force "homework."

By contrast, the lack of near to medium-term negotiations on non-strategic nuclear weapons combined with heightened requirements to assure U.S. frontline NATO allies at the least means that the Air Force nuclear mission in Europe will persist. More important, if the next U.S. administration actively explores steps to strengthen the NATO nuclear-nexus to Poland and the Baltics, it could result in some new mission and operational requirements, e.g., were a decision taken by NATO to put in place needed

logistics and contingency planning for deployment of nuclear weapons to pre-prepared sites in any of these countries.

Turning to Air Force contributions to decision-making, at least two areas stand out, one in the medium-term, one approaching post-2020. First, given direct Air Force responsibilities for U.S. nuclear weapons deployed in Europe, the Air Force has mission-related, operational, and other experience to be brought to bear in any future design and assessment of options to enhance nuclear assurance with NATO. Second, in the event of a Russian withdrawal from the INF Treaty, the Air Force also should be prepared to contribute to decision-making concerning potential U.S. responses, including any responses impacting existing or future Air Force missions and operational requirements.

Regarding near or medium-term “homework,” though admittedly “wild cards,” some analysis is warranted of the potential implications for Air Force missions, programs, and operations of a Russian withdrawal from New START or from the INF Treaty. In turn, an important priority would be to analyze options to enhance nuclear assurance in NATO and possible Air Force roles, particularly with a next NPR in mind. Looking toward a post-2020 “revival” of the strategic arms control process, there are several areas for potential Air Force “homework” now. The results of past Air Force analysis, table-top exercises, and other work related to an arms control regime that could well entail the control of nuclear warheads not delivery vehicles (from deployment to dismantlement) could be distilled for lessons learned for future negotiations. Particular problem areas from an Air Force perspective in such a nuclear warhead control regime could be identified and proposals made within the overall Interagency process for technical R & D now to work those problem areas. Most broadly, homework could be undertaken on different options for post-New START strategic arms control, with a goal of shaping a future debate.

U.S.-China Strategic Engagement – Toward Greater Confidence-Building, Reassurance, and Mutual Restraint?

Traditional treaty-based nuclear arms control has no role today in managing the U.S.-China strategic relationship. Chinese officials continue to argue that it is premature for China to become engaged in nuclear arms control, whether bilaterally with the United States or on a trilateral basis with the United States and Russia. Rather Chinese officials argue that China will become involved only following deep but unspecified levels of nuclear reductions by the United States and Russia. At most, Chinese officials and experts in informal dialogues sometimes state that China will not be an obstacle to U.S. and Russian nuclear reductions. This rejection of formal bilateral nuclear arms control is likely to continue for the foreseeable future.⁷

A Strengthening Strategic Dialogue. At the official (Track 1) and semi-official (Track 1.5) levels, however, a many-faceted process of strategic dialogue now exists between China and the United States. This process of dialogue reaches back across the Bush and Clinton Administrations. At the

official Track 1 level, it includes the U.S.-China Strategic and Economic Dialogue, the Defense Consultative Talks, the Defense Policy Coordination Talks, the Military-to-Military Dialogue, and the Exchanges between the PLA Planning Staff and the Joint Staff. Semi-official Track 1.5 dialogue includes the annual U.S.-China Strategic Nuclear Dialogue as well as the bi-annual U.S.-China Strategic Dialogue. These latter exchanges bring together senior officials, retired officials and military, and experts from both countries.

Through this process, a fairly robust process of military-to-military dialogue and interaction has now emerged, including senior-level visits, observation of military exercises, and some joint exercises. As discussed below, agreement also has been reached on steps to reduce the risk of military incidents. The conversations on strategic issues in other forums have been institutionalized and deepened in recent years. At the same time, China has resisted U.S. proposals, first made in the 2010 NPR, for beginning an official dialogue about U.S.-China strategic stability. Nonetheless, there is every reason to expect these U.S.-China processes of strategic dialogue will strengthen in the closing years of the Obama Administration and persist under its successor whether with a Democrat or Republican president.

A Future Process of Strategic Confidence-Building, Reassurance, and Predictability. Perhaps more important, across the dialogues, American participants have made specific proposals that could lead to a broader process of U.S.-China confidence-building, reassurance, and strategic predictability. For example, U.S. participants in the military-to-military exchanges have proposed agreements to reduce the risk of military incidents at sea or in the air as well as for mutual notification of missile launches. Similarly, in the semi-official Track 1.5 U.S.-China Strategic Nuclear Dialogue and the non-official Track 2 U.S.-China Strategic Dialogue a broad range of such measures has been proposed. Specific activities envisaged in these confidence-building and reassurance measures, as set out in the accompanying text box, include joint policy studies, joint threat and technical assessments, table-top exercises, and technical monitoring activities.⁸

Illustrative Proposals of U.S.-China Confidence-Building, Reassurance, and Predictability Measures

- Additional military-to-military exchanges
- Additional joint exercises and activities
- Exchanges on strategic stability, mutual strategic restraint; military doctrine; next U.S. Nuclear Posture Review
- Joint Studies of: new type of major power relationship; assurance gaps and options to address; strategic stability; crisis lessons learned and risks of escalation; no-first-use of nuclear weapons
- Joint threat assessments
- Table top exercises – U.S.-China crisis management, nuclear terrorist incident, Korean Peninsula crisis
- Chinese technical monitoring of selected U.S. missile defense tests
- Site visits – missile defense, nuclear site
- Advance notifications – ballistic missile launches; missile defense tests; Conventional Prompt Global Strike tests
- Technical exchanges on arms control verification approaches and technologies – “mock” New START inspections
- Declarations of no conventional attacks (including space-cyber) on nuclear systems
- Declarations of “no first attacks” – nuclear, space, cyber

The more immediate purpose of the military-to-military measures is to reduce the risk of incidents involving the U.S. and Chinese militaries that could lead to an unintended U.S.-China crisis or escalating confrontation. More broadly, the goal of confidence-building, reassurance, and mutual predictability measures is to address and to the extent possible reduce uncertainties and suspicions in both countries about the other countries' intentions, plans, and programs across the areas of nuclear offense, missile defenses, conventional prompt global strike, cyber, and space. Over the longer-term, this process aims to build habits of cooperation between the militaries and officials of the United States and China.

There has been progress in pursuit of military-to-military measures to avoid incidents and build confidence. Thus, at the November 2014 meeting between President Obama and President Xi, the two countries announced their agreement to Memos of Understanding for confidence-building mechanisms in two areas: "Notification of Major Military Activities, with annexes on notification of policy and strategy developments" and "Rules of Behavior for the Safety of Maritime and Air Encounters, with annexes and terms of reference and rules of behavior for encounters between naval surface vessels."⁹ At the time of the Obama-Xi meeting, as the language makes clear, more detailed procedures only had been reached on maritime encounters. Since then, agreement on comparable rules for air-to-air encounters, as called for in the basic agreement, has apparently proved elusive.¹⁰ Progress has been made to reach agreement on notification of ballistic missile launches but agreement still needs to be concluded.¹¹

With regard to the discussion of broader confidence-building, reassurance, and strategic predictability measures, Chinese participants in semi-official forums have shown interest in some of the specific proposals. They also have been prepared to explore the pros and cons of different measures as well as possible next steps. There also have been some recent steps forward at the Track 2 level, e.g., a recent decision to carry-out a table-top exercise involving U.S. and Chinese responses to a nuclear terrorist incident. Overall, however, the Chinese side still is moving very cautiously in this broader domain.

On balance, it is reasonable to assume that this overall process of confidence-building, reassurance, and predictability between China and the United States also very likely will continue to expand during the closing years of the Obama Administration and into the next administration. The November Obama-Xi agreements were a breakthrough and have likely created an important precedent, particularly for China which had long been skeptical of such measures as "Cold War" actions. The specifics still remain to be determined of what additional strategic confidence-building, reassurance, and predictability measures will be explored and eventually adopted. What is clear is that whatever measures the United States and China take, they will do so without labeling those steps as "arms control."

Toward Mutual U.S.-China Strategic Restraint – A "Wild Card"? Though for the most part unacknowledged, a process of U.S. and Chinese parallel unilateral restraint already exists between the

two countries. The United States, for example, has limited its deployment of ground-based missile defense interceptors, partly with the goal of reassuring China that national missile defense is not intended to neutralize China's limited nuclear deterrent. The 2010 Nuclear Posture Review also signaled U.S. restraint vis-à-vis China. Official and semi-official statements in Track 1.5 and other settings have also emphasized that were the United States to develop and deploy a conventional prompt global strike capability, that capability would be a niche capability of limited numbers. For its part, China has in the past restrained its nuclear modernization and affirmed a no-first-use of nuclear weapons posture. Chinese military personnel also have argued in various contexts that China's no-first-use policy has operational impacts on China's nuclear posture. Other statements have stressed that China's future nuclear modernization is linked to the U.S.-China offense-defense relationship.

Over the medium to longer-term, unilateral restraint and pursuit of confidence-building, reassurance, and predictability measures could be a stepping stone to a more structured process of mutual U.S.-China strategic restraint. Different versions of what such a process would entail have already been explored by several U.S. and Chinese experts and proposed publicly and in U.S.-China semi-official meetings.¹² Basically, the concept envisages agreement by the United States to limit military programs and activities seen as threatening by the Chinese in return for comparable Chinese restraint on programs and activities seen as threatening by the United States. The concept also envisages that either initially or over time, all strategic domains – offense (nuclear and long-range conventional), space, and cyber – could be included in such a process. The outcome would not be formal treaty-based limits but agreed parallel mutual restraint expressed by national political commitments. Transparency and other measures could be agreed to build confidence in implementation.

In principle, the development of such a process of mutual U.S.-China strategic restraint would serve a variety of both U.S. and Chinese security interests. For instance, such a process could well reduce the risk of arms racing, lessen the possibility of destabilizing strategic deployments and actions, enhance strategic predictability and reduce the need for worst-case defense planning. Perhaps most importantly, it could contribute to building greater cooperation between China and the United States while making it easier to manage inevitable conflicting interests and perspectives. In practice, there still are significant obstacles to this type of process, not least uncertainties about China's intentions as well as its readiness and ability to engage. Thus, depending on one's perspective, the development of a process of mutual U.S.-China strategic restraint could be considered either a longer-term possibility or simply a "wild card."

Accelerating U.S.-China Offense-Defense Arms Racing – A Very Different "Wild Card." Though still avoidable, the possibility of accelerating near to medium-term U.S.-China offense-defense strategic competition is another but very different "wild card." Despite the commitment of the two countries' presidents in the 2013 Sunnylands Summit to build a new type of cooperative major power

relationship, it is possible to identify political, military, and domestic factors that could result in a U.S.-China slide toward arms racing. Today's mutual uncertainties and suspicions about each other's intentions, capabilities, and doctrines would provide the context. More specific drivers would include: still-further heightening of Chinese assertiveness in staking its territorial claims in the East and South China Seas, with the risk of a U.S.-China military incident or confrontation; expansion of U.S. missile defenses in response to growing third-party proliferation threats; a possible future U.S. decision to develop and deploy long-range conventional prompt global strike capabilities, again in response to third-party threats; Chinese nuclear modernization, including accelerated deployments of MIRVed missiles; U.S. nuclear modernization, with debates about an uncertain Chinese nuclear capability; and the interaction of the two countries' doctrines for military operations in crisis or conflict.

U.S.-China Strategic Engagement: Some Possible Implications for the Air Force. If today's strategic dialogue evolves over the near to medium-term into a U.S.-China process of confidence-building, mutual reassurance, and enhanced strategic predictability and then perhaps even into a process of agreed parallel mutual restraint, this outcome would impact Air Force missions, operations, and programs. For now, it only is possible to speculate about such possible impacts. Future agreement to confidence-building and reassurance measures regarding either the technical capabilities of U.S. ground-based ballistic missile defenses or plans for pursuit of long-range conventional prompt global strike options are two examples. More broadly, offense-defense mutual restraint – perhaps a pledge of “no conventional attacks on nuclear systems” as has been proposed in the semi-official dialogue – is a different example. Even some lesser proposed confidence-building measures also could impact Air Force operations, e.g., proposals for carrying out “mock New START” inspections as part of a broader process of U.S.-China engagement on arms control verification conceptual and technical issues.

At least for the near-term, there would appear to be few implications for Air Force contributions to decision-making. For now, most discussion of U.S.-China confidence-building, reassurance, and predictability measures is likely to continue to take place in the semi-official dialogue. That said, it probably would be appropriate for the Air Force to ensure it maintained a “watching brief” on developments in the U.S.-China strategic dialogue.

By contrast, even in the near-term, there is Air Force “homework” that would help to prepare for the possible evolution of the U.S.-China strategic relationship in the direction posited here. Both positive and negative implications should be explored of such a process of confidence-building, reassurance, predictability, and mutual restraint. Consider but two examples. On the positive side, there is a need to assess whether and how this type of engagement could help to lessen U.S. and Air Force strategic concerns vis-à-vis China, from uncertainties about China's nuclear modernization to those associated with possible Chinese nuclear, space, or cyber escalatory steps in a U.S.-China military confrontation. On the

negative side, it is not too soon to think through what could be the potential military risks and operational impacts of this type of process, whether in terms of greater transparency of certain research, development, and testing activities or more direct limitations on deployment or use of specific capabilities. Ultimately, such “homework” would include developing an Air Force position on the concept of U.S.-China mutual strategic restraint.

The 2015 Nuclear Non-Proliferation Treaty Review Conference – What’s Next?

The five-yearly Nuclear Non-Proliferation Treaty Review Conference took place in April-May 2015. The conference brought together virtually all of the NPT’s Parties both to assess the implementation of the Treaty over the preceding five years (the so-called “looking back”) and to develop recommendations for priority actions to implement the Treaty over the next five years (the so-called “forward look.”). As in the past, the United States played a major role in the Review Conferences, reflecting U.S. support for the NPT as central to the global non-proliferation architecture. U.S. diplomacy sought a consensus outcome to the Conference that would have demonstrated support for the Treaty and strengthened its legitimacy. Also as at past Review Conferences, NPT non-nuclear weapon states used the five yearly Review as an opportunity to raise issues of concern and to seek commitments on Article VI nuclear disarmament from the NPT nuclear-weapon states. Ultimately, as already noted, agreement on a consensus Final Declaration was blocked by the United States, the United Kingdom, and Canada because of Egypt’s insistence that the Final Document include a call on the United Nations Secretary General to convene a conference to begin negotiations to establish a Middle East zone free of nuclear weapons and other weapons of mass destruction. Despite the lack of a consensus outcome, this Conference, as discussed below, could impact the Air Force in a number of ways – and thus, it warrants inclusion in this paper.

Some Key Themes in the Review Conference Nuclear Disarmament Debate. During the debate on NPT Article VI issues, the great majority of non-nuclear-weapon State NPT Parties expressed their strong sense of frustration with the pace of nuclear disarmament under Article VI of the NPT. Despite the dramatic nuclear weapon reductions since the Cold War, non-nuclear-weapon states argued that too little is being done to achieve the NPT’s nuclear disarmament goal. At the same time, most but not all non-nuclear-weapon states were highly critical of the so-called “step-by-step” approach to nuclear disarmament supported by the United States and the other NPT nuclear-weapon states. They argued that this approach had not and would not bring the results envisaged by the NPT. Many of these NPT non-nuclear-weapon states argued as well that there is a “legal gap” in international law; there are bans on chemical and biological weapons, but not nuclear weapons. These advocates argue that it is necessary to define what is required by the Article VI call for the negotiation of “effective measures” of nuclear disarmament and to set out those “effective measures” in a new, multilateral international legal

framework. In turn, so their argument continued, such a new international framework would implement and advance the NPT's own goal of nuclear disarmament. Among these non-nuclear-weapon states, there were differences, however, with regard to how to fill that legal gap. Oft-mentioned options include a nuclear-weapons convention, a nuclear weapons ban, or some type of overarching framework of agreements.

Nonetheless, there also was a smaller group of non-nuclear-weapon states, for the most part allies of the United States, that were more temperate in their criticism both of past nuclear disarmament progress and of reliance on a step-by-step, or as they would prefer to call it, a building block approach to nuclear disarmament. This division among non-nuclear-weapon states was one of the more striking changes in the NPT context and is likely to persist.

Equally important the 2015 Review Conference provided clear evidence of how the humanitarian consequences movement – and its focus on the risks and consequences of any use of nuclear weapons – has and continues to shape thinking and actions among the great majority of NPT non-nuclear-weapon states. Virtually all of the non-nuclear-weapon states have accepted the argument of more activist participants in the humanitarian consequences movement that the risk of use of nuclear weapons is high and growing higher. In support of that position, activists have focused on past as well as more recent incidents involving accidents with or a breakdown of control over nuclear weapons. This includes prominent recent incidents that involve the U.S. Air Force. Reflecting these concerns, virtually all of the non-nuclear-weapon states were signatories to one or the other of two different statements presented at the Review Conference on the risks of use of nuclear weapons, the need for actions to address those risks and to ensure that nuclear weapons are not used again, and on the urgency of nuclear disarmament. With regard to more specific actions, most non-nuclear weapon states supported – and the nuclear-weapon states rejected – further steps toward the full de-alerting of the nuclear weapons of the NPT nuclear-weapon states.

For their part, the NPT nuclear-weapon-states, both individually and as the P-5, argued strongly that they have been meeting all of their NPT obligations, including their obligations under Article VI. The positions of the nuclear-weapon states differed, however, on the humanitarian consequences movement, as was already indicated by the fact that the United States and the United Kingdom but not China, France, and Russia had been prepared to attend the December 2014 Vienna Conference.

An Open-Ended Working Group on Nuclear Disarmament. As the Review Conference neared its end on May 28, 2015, the participants had been able to narrow their differences on nuclear disarmament issues. Without going into specifics, suffice it to note that compromise language had been crafted to deal with key topics from calls for future nuclear disarmament to how to reflect the humanitarian consequences. Perhaps the most important nuclear disarmament “action item” in the draft

Final Document was the Conference's call for the creation of an Open-Ended Working Group on Nuclear Disarmament at the United Nations. Given the likelihood that this item will be carried forward despite the lack of a consensus outcome, it bears quoting in full:

The Conference recommends that the United Nations General Assembly establish at its seventieth session an open-ended working group to identify and elaborate effective measures for the full implementation of article VI, including legal provisions or other arrangements that contribute to and we required for the achievement and maintenance of a world without nuclear weapons. The legal provisions could be established through various approaches, including a stand-alone instrument or a framework agreement. Without prejudice to the prerogative of the United Nations General Assembly to determine the methods of work of its subsidiary bodies in accordance with its rules of procedure, the Conference recommends that the open-ended working group conduct its work on the basis of consensus. The Conference encourages all States to engage in this open and inclusive process.

Beyond the Lack of Consensus at the Review Conference -- The "Wild Card" of What Next?

The implications and repercussions of lack of consensus at the Review Conference are an important wild card. There have been other Review Conferences that did not reach agreement on a consensus Final Document, including those of 1980, 1990, 1995, and 2005. Thus, it is possible that as in the past, there will be few if any practical consequences from lack of consensus: the divisions among NPT Parties will persist on nuclear disarmament, the humanitarian consequences movement will remain part of the nuclear disarmament landscape, the overwhelming majority of NPT parties will continue to abide by their non-proliferation obligations, the nuclear arms control process with Russia will go forward as the end of New START approaches, and the NPT Parties will come back together at the 2020 Review Conference to rejoin their debate over nuclear disarmament. Little will change.

Nonetheless, it is at least conceivable – if not perhaps more likely than not – that the 2015 Review Conference will turn out to be a turning point in several respects with regard to nuclear disarmament and non-proliferation. At the least, it should be expected that the overwhelming majority of non-nuclear-weapon states will pursue the creation of a United Nations Open-ended Working Group on nuclear disarmament at the next session of the United Nations. In addition, over 100 countries have already adhered to the so-called “Humanitarian Pledge” with its call to fill the “legal gap” as well as to “stigmatize, prohibit, and eliminate nuclear weapons.”¹³ For these countries, the humanitarian consequences movement has created a new sense of urgency. Their representatives also are under steady pressure from prominent non-governmental organizations and experts that have been urging like-minded non-nuclear weapon states to negotiate a nuclear weapons ban without participation of the nuclear-weapon states. Thus, some type of “go-it-alone” action by some or perhaps even many non-nuclear-weapon states in reaction to the NPT breakdown should not be dismissed out of hand.

At the same time, as noted, there are divisions among the NPT non-nuclear-weapon states. Should a significant number of states pursue go-it-alone action of some sort the result would be a split among non-nuclear-weapon states. This split would be in addition to the long-standing split between nuclear-weapon states and non-nuclear-weapon states. As a result, there could be a dramatic fracturing of the NPT community, with an erosion of the effectiveness and legitimacy of the NPT.

As for the humanitarian consequences movement, there has been talk of a possible next meeting to be organized by South Africa. Even if not so hosted, a further meeting should be assumed as a given. Here, many of the same issues already raised concerning the risks of nuclear weapons will be highlighted again as well as proposals to address them, including de-alerting.

Further, though unlikely, the possibility cannot be ruled out that as time passes a group of non-nuclear weapon states could threaten withdrawal from the NPT. Their objective would be to create pressure for nuclear disarmament. In so doing, some of these states could well argue that because they also were members of one or another nuclear free zone treaty, their non-proliferation bona fides should not be questioned.

Even if a “wild card,” such concerns about a mix of go-it-alone action by the non-nuclear-weapon states and a further fracturing of the NPT need to be taken seriously by U.S. and likeminded supporters of the NPT. Thus, it should be expected that part of U.S. policy after the Review Conference will focus on ways to lessen the likelihood of these or other such actions or developments. Specific options remain to be identified, debated, and implemented. But in the nuclear disarmament field, actions could include a readiness to shape and participate in a future UN Open-Ended Working Group. There may also be interest in practical measures to address concerns about the risk of nuclear weapon use (including, for example, joint discussion and action within the P-5 Process). Attention also is likely to be focused on the International Partnership, in part to offer one element of a practical and effective way toward sustained nuclear disarmament and to strengthen the hand of more moderate NPT parties.

Some Possible Implications for the Air Force. The United States has already made clear its unwillingness to accept the more extreme proposals put forward by non-nuclear-weapon state activists, from calls for ending deployments of nuclear weapons outside of national territories to those for additional nuclear de-alerting. It assuredly will continue to do so should it decide to participate in a future UN Open-Ended Working Group. The U.S. position opposing any new international nuclear disarmament framework, nuclear weapons ban, or nuclear weapons convention also is quite clear. Thus, how the lack of a consensus outcome at the Review Conference seem unlikely per se to impact directly near or medium-term Air Force missions, operations, and programs. Nonetheless, it will continue to be very important to prevent any repeats of past mishaps and “whoopses” with Air Force procedures for the control, personnel reliability, and overall stewardship of the U.S. nuclear arsenal. Such incidents will only

give heightened credibility to activists’ arguments that the risk of a nuclear weapon incident is high -- and that dramatic change, if not go-it-alone action, is needed.

Looking out beyond 2015, there are several areas in which Air Force inputs could make important contributions to U.S. decision-making and overall posture on these NPT-related nuclear disarmament issues. Through the Joint Staff and wider Interagency process, the Air Force has a clear role to play in helping U.S. NPT diplomacy to continue to set out a compelling and convincing argument against the further de-alerting of U.S. nuclear forces. Similarly, Air Force inputs would be needed to continue to help make the case for the safety, security, and effective control of U.S. nuclear forces – and even more importantly, to ensure that there are no future highly-publicized breakdowns of nuclear-weapon procedures and controls. Somewhat differently, there are lessons learned from Air Force operations and past studies that could be tapped to provide inputs as U.S. NPT diplomacy continues to argue – now conceivably in a future United Nations Open-Ended Working Group – that nuclear disarmament is considerably more complicated for technical, operational, and political reasons than sometimes suggested by activist non-nuclear weapon states. Many of those lessons would speak directly to the complexities of making nuclear warheads the unit of account in a next phase of U.S.-Russian nuclear arms control. (Also see the discussion below of “National and International Verification Initiatives.”)

As for possible Air Force “homework” in the near-term, here, too, Air Force experience and lessons learned should be distilled as the International Partnership for Nuclear Disarmament Verification starts up. (Again, see below.) In addition, the 2020 NPT Review Conference will take place on the 25th anniversary of the Indefinite Extension of the NPT in 1995 and the 75th anniversary of the only uses of nuclear weapons. As 2020 approaches, the next U.S. administration will be looking for ideas on how to move the nuclear arms control process forward, particularly given the outcome of the 2015 Review Conference. Air Force thinking in the interim will remain needed to help identify promising options to serve U.S. security and to avoid missteps that could heighten risks and prove difficult to implement.

The P-5 Process in an Evolving Arms Control Future

It is very likely that the P-5 Process, with its mix of an annual well-publicized meeting of the five NPT nuclear-weapon states and a variety of inter-sessional work, will remain part of an evolving global arms control process. This is particularly so now that China has bought into the process as demonstrated by its readiness to host the April 2014 Beijing P-5 Conference. As discussed below, there is one “wild card” – the collapse of the P-5

NPT Action Plan Action 5 – An Agenda for P-5 Engagement

- Reductions of all types of nuclear weapons
- Role and significance of nuclear weapons
- Use, danger of nuclear war, non-proliferation
- Operational status of nuclear weapon systems
- Risk of accidental use
- Transparency and mutual confidence

Process due to heightened U.S.-Russia political-military confrontation.

Issues – Steady State to Stretching the Envelope. As currently reflected in the “Joint Statement” issued after each of the annual P-5 Conference, the core of the P-5 Process likely will remain a “tour d’horizon” of the different issues tied to the so-called three pillars of the NPT – nuclear non-proliferation, nuclear disarmament, and the peaceful uses of nuclear energy. From the arms control perspective, this steady-state near to medium-term future likely will also include a follow-on to the discussions of the “Glossary of Nuclear Terms” that was presented at the 2015 NPT Review Conference. The Chinese who have led this initial effort have indicated their interest in continuing it. Aside from the development of the “Glossary,” the discussions of nuclear terms are said by American participants to have provided important insights into how the other P-5 countries think about nuclear weapons, their roles, and other related issues. In this steady-state future, the P-5 Process also is likely to keep in view – though not rigidly follow – the agenda for engagement set by Action 5 of the 2010 NPT Action Plan, as endorsed or modified by the 2015 NPT Review Conference.

At the 2015 NPT Review Conference, non-nuclear-weapon states welcomed the P-5 Process but also in differing degrees expressed dissatisfaction with its practical results. Of potential importance, the draft Final Document included language that “urge[d] the nuclear-weapon States to continue undertaking all efforts necessary to comprehensively address the risks of unintended nuclear detonations, including, but not limited to, protection of command and control systems against potential cyber threats.” Even though the Final Document was not adopted by the Conference, it is reasonable to assume that some heightened discussion of reducing the risks of nuclear use will become part of the evolving P-5 Process.

Against this background, there are ways that the Obama administration and its successor could seek to deepen and broaden the P-5 Process in coming years.¹⁴ Among steps to deepen the P-5 Process, the following have been suggested and generated initial interest among U.S. officials involved in the P-5 process: an increased focus on arms control verification and transparency (including among the P-5); exchanges among P-5 countries on nuclear safety and security best practices if not the development of a “Code of Responsible Nuclear Behavior;” exchanges on possible cooperative responses to deal with a terrorist nuclear incident; and exchanges on P-5 cooperative actions to minimize the risk of a next use of a nuclear weapon. At the same time, today’s P-5 Process could continue to be broadened to include greater interaction and engagement with the NPT’s non-nuclear-weapon states. For the first time, at the February 2015 London P-5 Conference there was greater outreach to NPT non-nuclear weapon states. This outreach included a special session involving exchanges between the NPT nuclear- and non-nuclear-weapon states. In the final analysis, the success of any future proposals that might be put forward by the Obama Administration or its successor to deepen and broaden the P-5 Process will depend most on the

overall state of U.S.-Russian relations and to a lesser degree on the flexibility of China and France. That said, some stretching of the envelope of the P-5 Process is definitely not out of the question.

The P-5 Process and Some Possible Implications for the Air Force. An evolving P-5 Process appears likely to have few if any direct impacts on Air Force missions, operations, and programs. If the P-5 Process deepens to include sustained exchanges on arms control verification, with possible participation in “mock inspections” by other P-5 members, there could be impacts on day-to-day Air Force operations. Such impacts, however, likely would be comparable to those already associated with “real” inspections under New START.

By contrast, there may be more immediate implications in terms of Air Force contributions to decision-making. As the P-5 Process enters its next phase, it would be appropriate for the Air Force to make its views known through the Joint Staff concerning possible near- and medium-term priorities for that Process. Of the various ways to deepen the P-5 Process, which ones, if any, would support Air Force missions – and which ones would make those missions more difficult? Are there other considerations and Air Force equities that should be taken into account in deciding whether and/or how to deepen P-5 engagement? Assuming that the P-5 Process comes to include discussions of cooperative actions to reduce the risk of a nuclear detonation, what should be the agenda for any such discussions?

There also is “homework” to be done in the near-term. One example would be to think through what types of questions and issues the Air Force would suggest addressing in phase-two discussions of the “Glossary of Nuclear Terms.” More broadly, it would be appropriate to undertake an internal Air Force assessment of the pros and cons of the different ways of deepening the future P-5 Process – and how that Process could impact both positively and negatively Air Force missions and operations. Red teaming to identify possible risks – and ways of mitigating them – of a deepened P-5 Process that led to greater on-site involvement by other P-5 countries would be another example.

National and International Verification Initiatives – Adapting Existing Capabilities, Breaking New Ground

The future arms control agenda also likely will be characterized by efforts both to strengthen U.S. national capabilities for monitoring and verification and by heightened international cooperation to develop the conceptual and technical capabilities needed to verify deeper reductions and actual elimination of nuclear warheads. Consider some of the likely dimensions.

DSB Monitoring and Verification Study. The January 2014 Defense Science Board Report on “Assessment of Nuclear Monitoring and Verification Technologies” states that new national and international monitoring and verification initiatives are a needed response to the continued evolution of the threat of nuclear proliferation. The core of that changing threat is said to be the increasing accessibility of nuclear knowledge, the emergence of new pathways and technologies for proliferation,

and greater opportunities for access to nuclear materials from expanding global use of nuclear power. The result is seen to be new challenges for monitoring “[s]mall inventories of weapons and materials . . .”; “[s]mall nuclear enterprises . . .”; and “[u]ndeclared facilities and/or covert operations . . .”, all often in an environment in which U.S. access is “. . . limited or extremely difficult . . .”¹⁵ In response, the DSB calls for a wide mix of international and national, cooperative and unilateral monitoring and verification initiatives. It is beyond the scope of this short paper to provide an assessment of the state-of-play in implementing the DSB’s recommendations. Suffice it here to suggest that as with other DSB studies, they will play a role in shaping internal U.S. thinking about the need for new national and international monitoring and verification activities.

International Partnership for Nuclear Disarmament Verification.

From a different perspective, the December 2014 U.S. initiative to create an International Partnership for Nuclear Disarmament Verification – referred to here as the International Partnership – is intended to create a new mechanism for collaboration with other countries to explore, and to the extent possible, find ways to meet future nuclear disarmament verification challenges. This U.S. proposal has its roots in long-standing U.S. support for a robust NPT. On the eve of the 2015 NPT Review Conference, the initiative buttressed U.S. NPT diplomacy, especially by its call for practical engagement between nuclear-

weapon and non-nuclear-weapon states on nuclear verification. Beyond the Review Conference, such engagement will help to shape the nuclear disarmament debate by demonstrating the tough technical issues and questions, highlighted by Under Secretary of State Gottemoeller in announcing this initiative, that need to be resolved. Over the longer-term, the International Partnership may well produce practical solutions, acceptable to all NPT Parties, to facilitate deeper nuclear reductions to implement NPT Article VI. This new initiative also is taking shape at the time when the United States has begun a program of “transparency visits” by officials from selected NPT non-nuclear-weapon states to Department of Energy nuclear laboratories and other sites.

Some Recommendations of DSB Monitoring and Verification Study

- Develop and implement a U.S. engagement plan to build international cooperation and transparency – beginning with the P-5 countries and then more broadly
- Pursue international R & D on automated monitoring and reporting supported by information barriers and authentication
- Plan to accommodate greater transparency into U.S. nuclear modernization
- Implement an integrated, more comprehensive and responsive U.S. monitoring architecture – with associated processes and implementation activities, new and rebalanced investments, and actions by different USG agencies
- Leverage specialized capabilities related to persistent surveillance, automated tracking, rapid analysis of large data sets, and open source analysis for their nuclear monitoring applications
- Modernize the U.S. Atomic Energy Detection System (AEDS)

A first meeting of International Partnership participants took place in March 2015 and brought together two nuclear-weapon states and twenty-three non-nuclear-weapon states. Participation ranged across the NPT's Parties, including both developed and developing countries, activists among the non-nuclear-weapon states and U.S. allies. The specifics of this new International Partnership are still being worked out, including particularly what issues will be addressed, with what technical working groups, over what period of time, and with what interaction with the wider NPT community. A follow-on meeting is to be held in late 2015 to finalize the program of work.

Over time, the International Partnership can be expected to address the full spectrum of conceptual issues related to verification of nuclear disarmament, from requirements to potential approaches, from lessons learned from past verification to priorities for next steps. Technical discussions, experiments, and pilot R & D projects will be a central part of the initiative – all within the limits set by the need to protect classified information as well as by the NPT nuclear-weapon states NPT Article I obligation “not to assist” other countries to acquire nuclear weapons or other nuclear explosive devices.

Paralleling U.S. activities, the future arms control agenda also will include related international nuclear verification efforts. U.S. cooperation is continuing with the United Kingdom in exploring issues related to the monitored dismantlement of nuclear warheads. The United Kingdom also is considering further collaboration with Norway in that area. The Group of Governmental Experts at the Conference on Disarmament is focused partly on discussions of verification of a future limits on the production of fissile material for nuclear weapons.

National and International Verification Initiatives and Some Possible Implications for the Air Force. Should it gain traction, the DSB's recommendation that the U.S. Atomic Energy Detection System (AEDS) be modernized would directly impact Air Force missions, programs, and operations. Similarly, the DSB recommendation of building the potential for greater transparency into U.S. nuclear modernization could impact modernization of the Air Force elements of the triad.¹⁶ More broadly, U.S. pursuit of heightened international transparency could result in requirements to provide greater information about specific Air Force plans and programs, particularly in the context of any reciprocal instances of P-5 nuclear, space, and/or cyber transparency. In addition, as the new International Partnership gathers momentum, there also could well be possible preliminary steps suggested or taken that could modestly impact Air Force operations, e.g., in the not unlikely event that “mock” New START inspections were used as a means to familiarize non-nuclear-weapon states with the procedures, complexities, and issues of arms control inspections. The International Partnership also could result in new requests for information about Air Force operations to support near and medium-term conceptual work, e.g., about the life-cycle of nuclear warheads while under Air Force control.

The Air Force also has a clear role to play in contributing to U.S. decision-making concerning heightened national and particularly international verification and transparency initiatives. Again, decisions about the U.S. AEDS directly impact Air Force equities. Depending on the specifics the International Partnership, as already suggested above, also could impact Air Force equities and raise operational concerns in ways that might not necessarily be fully appreciated across the Interagency. Perhaps most important, there likely are many ways that the Air Force could contribute to the design and development of the new International Partnership and to international activities more broadly to understand and address future arms control verification challenges.¹⁷ In that regard, one important step would be to bring to the table Air Force experiences and lessons learned from nearly 50 years of verification of bilateral U.S.-Russian arms control treaties (including nearly 30 years of on-site inspections). By way of example, lessons learned could include those associated with hosting on-site inspections at Air Force bases, with the role and impact of different types of notifications, and from approaches to verify the number of warheads on given systems. Over the past two decades, the Air Force also has been involved with a number of verification initiatives – studies, table-top exercises, red teaming, and field exercises – all with an eye on future U.S.-Russia nuclear negotiations that would make nuclear warheads the unit of account. All of this work would offer valuable insights for internal U.S. thinking about the design and development of the International Partnership.

In light of the above points, there clearly is some Air Force “homework” that would be valuable to do now in anticipation of greater international verification activities. Assessment of Air Force equities that could be impacted by international verification cooperation and initiatives, distilling experience and lessons learned, and pulling together the results of past work stand out. One particular area highlighted by the DSB study would be to assess the implications of greater international transparency for Air Force nuclear operations, including the Air Force legs of a modernized triad. In part, such “homework” would call for traditional staff work. But it also could prove valuable to tap the institutional experiences and memories of selected Air Force personnel involved over recent and past decades, whether as “recipients” of on-site inspections, participants in analytic work and exercises, or with other unique backgrounds. Such an oral history could be done with a mix of workshops, one-on-one interviews, and responses to written questions. Once done, it would provide a valuable input not only into Air Force thinking but also that of the wider Interagency. Plus where problems were identified, such material would provide “chapter and verse” to give weight to Air Force positions in future Interagency deliberations on monitoring and verification issues.

Multilateral Nuclear Negotiations and Activities – Near Term Stalemate, Longer-term Uncertainty

There is little if any reason to expect that today’s stalemate in the domain of multilateral nuclear arms control negotiations will be overcome in the closing year plus of the Obama administration. China

will continue to reject Russian calls for multi-party U.S.-Russia-China strategic negotiations on the grounds that the United States and Russia bear the primary responsibility for nuclear reductions now. The Group of Governmental Experts on a fissile material treaty at the Conference on Disarmament (CD) will report on its work in 2015. There also could be agreement to continue its activities. However, more likely than not, Pakistan (with China behind it in the wings) will continue for the foreseeable future to block the start of CD negotiations of a treaty cutting-off production of fissile material for nuclear weapons (an FMCT).

With regard to Nuclear Weapon Free Zone (NFZ) Treaties, the primary focus in the near to longer-term will be signature and then ratification by the P-5 nuclear-weapon states of the Protocols to the existing NFZs. Most important, these Protocols obligate the nuclear-weapon states not to threaten or use nuclear weapons against Parties to these zones. At the 2015 NPT Review Conference, the United States stated its commitment to signing the revised Protocol to the Southeast Asia Nuclear Free Zone (SEANFZ) Treaty. Over the medium to longer-term the issue will be whether the next U.S. administration can muster sufficient political support in the U.S. Senate to ratify not only the SEANFZ Protocol but also the other NFZ Protocols that the United States has signed – associated with the South Pacific Nuclear Free Zone, the Central Asian Nuclear Free Zone, and the African Nuclear Free Zone.

Barring an unexpected and severe shock, today's moratorium on nuclear testing by the five NPT nuclear-weapon states almost certainly will persist. History indicates that nuclear testing by North Korea, Pakistan, or India most probably would not comprise a sufficient shock to end the P-5 nuclear testing moratorium. Nonetheless, entry into force of the Comprehensive Test Ban Treaty (CTBT) is at best unlikely for the foreseeable future given continuing lack of sufficient political support for U.S. ratification. (There are many reasons to assume, however, that were the United States to ratify CTBT, China would very rapidly follow suit. At that point, it is conceivable that a way would be found to revise or work around the fact that the Treaty does not enter into force until it is ratified by all of the 44 countries specified in Annex 2 of the Treaty).

Multilateral Nuclear Arms Control and Some Implications for the Air Force. These potential developments in the multilateral nuclear arms control domain appear likely to have few if any additional implications for the Air Force over and above today's Air Force activities across the three baskets of missions, programs, and operations; contributions to decision-making; and "homework." At most, therefore, the Air Force may want to maintain a "watching-brief" on multilateral arms control.

THE FUTURE ARMS CONTROL AGENDA – SOME CONCLUDING THOUGHTS ON IMPLICATIONS FOR THE AIR FORCE

By way of conclusion, this final section first puts forward three overarching judgments about the implications for the Air Force of the future nuclear arms control agenda. First, as in the past, important

future nuclear arms control developments will impact Air Force missions, programs, and operations. Some of those impacts will be relatively small, e.g., as would be the case were the Air Force asked to host a “mock” New START inspection, whether to support the new International Partnership or as part of possible U.S.-China arms control verification exchanges. Other impacts, however, could be more far-reaching if perhaps less near-term, e.g., adapting Air Force missions and operations to accommodate a process of U.S.-China confidence-building, reassurance, and predictability or an eventual follow-on to New START. As noted, a number of “wild cards” also could change the future nuclear arms control agenda, again with Air Force implications.

Second, from the broad perspective of U.S. national security and from the narrower perspective of Air Force missions, programs, and operations, there will be some “bad” or “questionable” proposals put forward over the next decade for nuclear arms control next steps. Proposals for de-alerting all U.S. nuclear forces, unilateral reductions of U.S. nuclear weapons, or withdrawal from the INF Treaty or from New START as a response to Russian INF non-compliance all are examples. Active Air Force engagement in U.S. arms control decision-making will be necessary to ensure that Air Force equities are effectively set out and heard.

Third, perhaps most important, there are many ways that the Air Force can contribute substantively and substantially to the design and development of future U.S. nuclear arms control positions and initiatives in a way that supports U.S. national security goals – in effect, taking a leadership role. Again, some of these ways are small, e.g., as with bringing to the table of the International Partnership as well as possible verification engagement with China, the lessons and insights from the past quarter-century of Air Force sites being subject to on-site inspections. Other potential contributions would be much more far-reaching, e.g., thinking now about the potential dimensions of a U.S.-China nuclear confidence-building, reassurance, and restraint regime or about the contours of a post-New START U.S.-Russia arms control regime. Regardless of the specific example, there will be important opportunities for the Air Force to play a leadership role in arms control. Doing so would make an important contribution to the effective development and successful negotiation of U.S. arms control positions.

Possible Areas for Air Force Nuclear Arms Control “Homework” – a Quick Reprise. Across the different nuclear arms control domains, Air Force readiness to engage effectively in an evolving, future arms control process would be advanced by doing some information-gathering, analysis, red teaming, and contingency-planning – in effect, arms control “homework.” This paper already is one example; other examples of such “homework” are almost certainly underway. Drawing on the analysis here, the following reprises the items identified in the course of the Section 2 discussion. The list is a

relatively long one so it would be necessary to set priorities in developing what would be a multi-year process. Domain by domain, the following stand out:

Topic	Air Force “Homework”
<i>U.S.-Russia Nuclear Arms Control</i>	<ul style="list-style-type: none"> • Undertake limited contingency planning to be prepared for the near to medium-term arms control “wild cards” of Congressional defunding of New START implementation or a Russian withdrawal from New START • In light of Russia’s rejection of negotiations on non-strategic nuclear weapons and the changing security dynamic in Europe and Asia, undertake analysis of the full-range of options to enhance nuclear assurance of U.S. frontline NATO allies as well as of Japan and South Korea in Asia • Identify and assess possible U.S. response options (including their implications for Air Force missions) to a Russian withdrawal from the INF Treaty • Bring together the lessons and insights from past Air Force analysis, table-top exercises, and other work related to the control and verified elimination of nuclear warheads • Undertake analysis of options for a post-New START U.S.-Russia nuclear arms control regime which entails the verified elimination of nuclear warheads • Undertake analysis of the implications for Air Force missions, programs, and operations of the “wild card” of the collapse of U.S.-Russia strategic nuclear arms control after New START ends
<i>U.S.-China Strategic Engagement</i>	<ul style="list-style-type: none"> • Develop an inventory of existing proposals for U.S.-China strategic confidence-building measures and assess the potential impact on Air Force operations of the most credible proposals • Undertake analysis of the implications for Air Force missions, programs, and operations of the development over the near to medium-term of a more comprehensive process of U.S.-China strategic confidence-building, mutual reassurance, and strategic predictability • Identify and assess options to use such a regime to address Air Force strategic concerns vis-à-vis China, from uncertainties about China’s space, cyber, and nuclear plans and programs to possible Chinese space, cyber, or nuclear escalatory steps in a U.S.-China regional crisis • Analyze implications for Air Force missions, programs, and operations of the two “wild cards,” on the one hand, the emergence of a process of U.S.-China mutual strategic restraint or on the other hand, accelerating U.S.-China offense-defense competition
<i>Beyond the 2015 NPT Review Conference</i>	<ul style="list-style-type: none"> • Contribute to Interagency efforts to develop and set out compelling and convincing arguments against the further de-alerting of U.S. nuclear forces • Contribute to Interagency efforts to make the case for the safety, security, and effective control of U.S. nuclear forces • As an input to U.S arguments about the complexity of nuclear disarmament, bring together the lessons and insights from past Air Force analysis and work related to the control and verified elimination of nuclear warheads as well as the lessons from on-site inspections at Air Force sites • Contribute to the develop of U.S. position papers, presentations, and arguments to be set out in a future United Nations Open-Ended Working Group on Nuclear Disarmament, assuming creation of such a group and a U.S. decision to participate

	<ul style="list-style-type: none"> • Prevent any repeats of past mishaps and “whoopses” with Air Force procedures for the control, personnel reliability, and overall stewardship of the U.S. nuclear arsenal lest such incidents can give heightened credibility to activists’ arguments that the risk of a nuclear weapon incident is high -- and that dramatic change if not go-it-alone action is needed
<i>The P-5 Process</i>	<ul style="list-style-type: none"> • Identify and put forward in the Interagency, possible terms and concepts of Air Force interest to be discussed in a second phase of the P-5 project to create a “Glossary of Nuclear Terms” • Prepare to manage possible “mock” inspections at Air Force sites, whether as part of P-5 engagement on arms control verification or international verification cooperation • Contribute to the design of an agenda for P-5 discussions of cooperative actions to reduce the risk of a nuclear detonation
<i>National and International Verification Initiatives</i>	<ul style="list-style-type: none"> • Assess and respond to the DSB recommendation for modernization of the Atomic Energy Detection System • Assess the implications of future international transparency requirements for a modernized U.S. triad • Identify ways in which near to medium-term activities of the new U.S.-proposed International Partnership on Nuclear Disarmament Verification, could impact Air Force operations and evaluate possible options to mitigate any such impacts, e.g., related to greater transparency of Air Force operations, site- visits, or mock inspections • As possible input to Interagency implementation of the International Partnership assess collect and distill Air Force experience and lessons learned from bilateral U.S.-Russia arms control verification – including via an Air Force “oral history” • Again as background to the International Partnership, collect and distill the lessons learned from past internal Air Force verification initiatives (and those in collaboration with other USG players) concerned with the control and verification of nuclear warheads – including via an Air Force “oral history”
<i>Multilateral Nuclear Negotiations and Activities</i>	<ul style="list-style-type: none"> • Maintain a “watching-brief” on multilateral arms control, reflecting very low likelihood of new negotiations, e.g., on FMCT.

ENDNOTES

¹ Most recently, these goals have been reiterated by Under Secretary of State Rose Gottemoeller in Rose Gottemoeller, “The Vision of Prague Endures,” Prague, Czech Republic, December 4, 2014.

² Consistent with the above discussion, the following assumes that none of the “wild cards” have occurred that would have led to non-implementation or withdrawal from New START by the United States or Russia.

³ See U.S. Department of State, “Adherence to and Compliance with Arm Control, Nonproliferation, and Disarmament Agreements and Commitments,” July 31, 2014.

⁴ Article XV reads: “Each Party shall, in exercising its national sovereignty, have the right to withdraw from this Treaty if it decides that extraordinary events related to the subject matter of this Treaty have jeopardized its supreme interests. It shall give notice of its decision to withdraw to the other Party six months prior to withdrawal from this Treaty. Such notice shall include a statement of the extraordinary events the notifying Party regards as having jeopardized its supreme interests.”

⁵ See Testimony of Steven Pifer to the House Armed Services Committee, “The INF Treaty, Russian Compliance and the U.S. Policy Response,” July 17, 2014.

⁶ See U.S. Department of State, “Adherence to and Compliance with Arm Control, Nonproliferation, and Disarmament Agreements and Commitments,” July 31, 2014.

⁷ China’s signature of the CTBT is a partial exception to its overall standing-aside from nuclear arms control. Like the United States, China has not ratified CTBT. Many experts believe that as was the case with the Chemical Weapons Convention, China would ratify CTBT once the United States had done so.

⁸ By way of example, see: Linton F. Brooks, “Looking to the future: Potential Sino-U.S. confidence building measures”, Paper initially presented at the Sixth U.S.-China Strategic Dialogue, U.S. – China Strategic Nuclear Dynamics, Honolulu Hawaii, June 5-7, 2011.

⁹ Fact Sheet: President Obama’s Visit to China, November 11, 2014. Also see for a brief overview, David Shambaugh, “A Step Forward in US-China Ties,” Brookings, November 14, 2014; Bonnie Glaser and Jacqueline Vitello, *Comparative Connections, U.S.-China Relations: Summit Provides Renewed Momentum for Better Ties*, CSIS/Pacific Forum, January 2015.

¹⁰ See Julian Barnes and Jeremy Page, “Pentagon Pauses New Exchanges with China,” *Wall Street Journal*, 29 January 2015.

¹¹ China already has an agreement with Russia providing for mutual notification of missile launches.

¹² See, for example, Wu Riqiang, “China’s Anxiety about U.S. Missile Defense: A Solution,” *Survival*, Oct-Nov.-2013; Lewis A. Dunn, “Exploring the Role of U.S.-China Mutual and Cooperative Strategic Restraint,” in Li Hong, Lewis Dunn, and Ralph Cossa, “Building toward a Stable and Cooperative Long-term U.S.-China Strategic Relationship, December 2012; David C. Gompert and Philip C. Saunders, *The Paradox of Power: Sino-American Strategic Restraint in an Age of Vulnerability*, U.S. National Defense University, 2011.

¹³ “The Humanitarian Pledge,” http://www.icanw.org/wp-content/uploads/2015/03/HINW14vienna_Pledge_Document.pdf

¹⁴ The following ideas draw upon conversations with Americans now involved in the P-5 Process as well as on their own responses to ideas put forward by the author as the U.S. expert at the P-5 Public Event associated with the April 2014 Beijing P-5 Conference as well as in other forums.

¹⁵ Defense Science Board, “*Assessment of Nuclear Monitoring and Verification Technologies.*,” pp.1-2.

¹⁶ This recommendation about building in a capability for greater transparency would apply even more in the event of a future U.S. decision to go forward with a long-range, ground-based conventional prompt global strike capability. To give but two examples: greater transparency from deployment to operations could provide a necessary means to reassure China about the threat posed by a deployed capability as well as to lessen possible Russian or Chinese misinterpretation of whether an actual launch involved a nuclear not a conventional warhead.

¹⁷ Other U.S. government entities also will have experiences and lessons learned to be blended with Air Force perspectives, e.g., the On-Site Inspection Agency, the National Laboratories, and the Intelligence Community.